

# Translation

## PATENT COOPERATION TREATY

PCT/EP2003/005338



# PCT

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY (Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 46 361 - 22	<b>FOR FURTHER ACTION</b> See Form PCT/IPEA/416	
International application No. PCT/EP2003/005338	International filing date (day/month/year) 22 May 2003 (22.05.2003)	Priority date (day/month/year) 13 November 2002 (13.11.2002)
International Patent Classification (IPC) or national classification and IPC A61K 6/08		
Applicant VOCO GMBH		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 8 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
  - a. ☒ (sent to the applicant and to the International Bureau) a total of 14 sheets, as follows:
    - ☐ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).
    - ☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
  - b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) \_\_\_\_\_, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

- ☒ Box No. I Basis of the report
- ☐ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

Date of submission of the demand 25 May 2004 (25.05.2004)	Date of completion of this report 07 March 2005 (07.03.2005)
Name and mailing address of the IPEA/EP	Authorized officer
Facsimile No.	Telephone No.

## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/EP2003/005338

## Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language \_\_\_\_\_, which is language of a translation furnished for the purpose of:
- ☐ international search (under Rules 12.3 and 23.1(b))
- ☐ publication of the international application (under Rule 12.4)
- ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ The international application as originally filed/furnished
- ☒ the description:
- pages \_\_\_\_\_ 11-18 \_\_\_\_\_, as originally filed/furnished
- pages\* \_\_\_\_\_ 1-10 \_\_\_\_\_ received by this Authority on \_\_\_\_\_ 17 September 2004 (17.09.2004)
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the claims:
- pages \_\_\_\_\_, as originally filed/furnished
- pages\* \_\_\_\_\_, as amended (together with any statement) under Article 19
- pages\* \_\_\_\_\_ 1-18 \_\_\_\_\_ received by this Authority on \_\_\_\_\_ 19 February 2005 (19.02.2005)
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☒ the drawings:
- pages \_\_\_\_\_, as originally filed/furnished
- pages\* \_\_\_\_\_ 1-3 \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- pages\* \_\_\_\_\_ received by this Authority on \_\_\_\_\_
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages \_\_\_\_\_
- ☐ the claims, Nos. \_\_\_\_\_
- ☐ the drawings, sheets/figs \_\_\_\_\_
- ☐ the sequence listing (*specify*): \_\_\_\_\_
- ☐ any table(s) related to sequence listing (*specify*): \_\_\_\_\_

\* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

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Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

- ☐ the entire international application.
- ☒ claims Nos. 4, 15

because:

- ☐ the said international application, or the said claims Nos. \_\_\_\_\_  
relate to the following subject matter which does not require an international preliminary examination (*specify*):

- ☐ the description, claims or drawings (*indicate particular elements below*) or said claims Nos. \_\_\_\_\_  
are so unclear that no meaningful opinion could be formed (*specify*):

- ☒ the claims, or said claims Nos. 4, 15 are so inadequately supported  
by the description that no meaningful opinion could be formed.

- ☐ no international search report has been established for said claims Nos. \_\_\_\_\_

- ☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the  
Administrative Instructions in that:

the written form

- ☐ has not been furnished

- ☐ does not comply with the standard

the computer readable form

- ☐ has not been furnished

- ☐ does not comply with the standard

- ☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with  
the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

- ☐ see Supplemental Box for further details.

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
PCT/EP 03/05338

## I. Basis of the report

1. This report has been drawn on the basis of *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments.)*:

This report was established without taking into consideration the amendments to claims 4 and 15 submitted with the letter of 18 February 2005.

The relevant passages in the claims are as follows:

- "... the filler contains 50 to 100 % by weight" (claim 4)
- "... and/or heavy metal oxides with atomic numbers greater than 28" (claim 15).

Supplemental Box  
(To be used when the space in any of the preceding boxes is not sufficient)

Continuation of: III.1

**Non-establishment of opinion with regard to novelty,  
inventive step and industrial applicability**

The reasons for non-establishment are as follows:

The amendments submitted to the International Bureau under PCT Article 34 (2) (b) introduce substantive matter which, contrary to PCT Article 34(2) (b), goes beyond the disclosure in the international application as filed. The amendments are as follows:

"Composite material [...], characterized in that the filler contains 50 to 100 % by weight filler particles in the shape of a torus."

This is inconsistent with the scope of protection sought in the application as filed.

The amended claim 15 does not meet the requirements of PCT Article 5 and 6 since it lacks sufficient disclosure and is not sufficiently supported by the description.

The wording "... and/or heavy metal oxides with atomic numbers **greater than 28**" is not supported by the description or examples.

The extrapolation is not justified.

## INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No.  
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## V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

## 1. Statement

Novelty (N)	Claims	1-3, 5-14, 16-18	YES
	Claims		NO
Inventive step (IS)	Claims	1-3, 5-14, 16-18	YES
	Claims		NO
Industrial applicability (IA)	Claims	1-3, 5-14, 16-18	YES
	Claims		NO

## 2. Citations and explanations

Reference is made to the following documents:

D1: US 4839215 A  
D2: DE 3637371 A  
D3: DE 3532997 A.

## I) Novelty

Document D1 describes torus-shaped filler particles and dental composite materials comprising these fillers, wherein the fillers are mechanically connected by the binder and therefore improve the mechanical properties of the fully polymerized composite materials. The tori have an outside diameter of between 425 and 200 micrometers. Since the outside diameters of the tori differ, document D1 is not considered prejudicial to the novelty of the subject matter of claims 1-3, 5-14 and 16-18 (PCT Article 33(1) and (2)).

The prior art documents D2 (see column 5, lines 2-40) and D3 (see page 3) merely disclose that composite materials with a polymerizable organic binder can contain a filler with filler particles and can also contain a silicic acid sol, as per the independent claim 2 of the present

application.

Documents D2 and D3 are not prejudicial to the novelty of the above subject matter of claims 1-3, 5-14 and 16-18 (PCT Article 33(1) and (2)).

## II) Inventive step

Document D1 is considered the prior art closest to the subject matter of claims 1-3, 5-14 and 16-18. It discloses torus-shaped filler particles and dental composite materials.

The subject matter of claims 1, 2, 17 and 18 differs from the prior art according to document D1 in that the outside diameter of the tori of the present application is considerably smaller than that specified in document D1 (D1: 220-425 micrometer; present application: 0.5-100 micrometer).

The problem to be solved by the present application is therefore understood to be that of providing a filler which enters into a stable bond with the organic phase, is hydrolysis-stable and has improved technical properties.

This problem is solved by a composite material characterized in that it contains 1 to 90 % by weight of a filler obtained by spray drying and a polymerizable binder. The filler particles are in the shape of a torus and have a mean outside diameter of 0.5 to 100 micrometer.

**Advantages:**

The combination of torus-shaped filler particles having an outside diameter of 0.5 to 100 micrometers with the additional nanoscale silicic acid sol (claim 2) and the polymerizable binder results in the desired improved mechanical properties with regard to low shrinkage, low abrasion and high bending strength.

**Technical effect:**

The effect results from a homogeneous distribution of the filler and polymer owing to the presence of the discrete, non-agglomerating nanoscale silicic acid particles and the polymer in the matrix filling the torus ring.

The strengthening of the mechanical bond by the composite material according to claim 2 is achieved by the presence of a composite and not only by a resin.

Consequently, the subject matter of claims 1-3, 5-14 and 16-18 involves an inventive step (PCT Article 33(1) and (3)).